



299585

October 23, 2006

Mr. Matthew Ohl
USEPA Region 5
77 West Jackson Blvd.
Mail Code: HSRW-6J
Chicago, IL 60604-3590

Re: TBCW Piezometer Installation
Enviro-Chem Superfund Site
Zionsville, Indiana

Dear Mr. Ohl:

This letter report has been prepared to present the details of the piezometer installation activities recently conducted at the Environmental Conservation and Chemical Corporation (ECC) Superfund Site (the "Site") on behalf of the ECC Site Trust Fund. The piezometers were installed as part of the thin barrier curtain wall (TBCW) portion of the Attachment Z-1 Remedy to allow monitoring of hydraulic gradients in the till and the sand and gravel units near the TBCW.

Twelve piezometers were installed in four sets of three, along the TBCW. For each set of piezometers, one piezometer was installed in the till unit downgradient of the TBCW (PT designation); a second piezometer was installed in the till unit upgradient of the TBCW (PT designation); and a third piezometer was installed within the sand and gravel unit, adjacent to the upgradient till unit piezometer (PS designation).

The piezometers were installed by Earth Exploration, Inc. of Indianapolis, with ENVIRON oversight, immediately after completion of the TBCW in June 2006. Procedures for the piezometer installation were provided in the *Design Report for the Thin Barrier Curtain Wall and the Till Water Pump Testing*, dated September 2005, and are summarized below. The surveyed locations of the TBCW piezometers are shown on Figure 1.

Sand and Gravel Unit Piezometer Installation

The sand and gravel unit piezometer borings were performed first, using water rotary drilling methods. In order to confirm the depth of the upper and lower till units, split-spoon soil samples were taken at 2-foot intervals. The soils were logged and screened for organic vapors using a photoionization detector (PID). Results are provided on the well logs presented in Attachment 1.

Initially, each sand and gravel piezometer borehole was extended to approximately the base of the till unit as determined by observation of the split-spoon samples. In order to prevent potential cross contamination of the lower units from the shallow till zone, a 10-inch ID steel casing was set to that depth and sealed with bentonite before the boring was continued. After several days, when the bentonite slurry was set, a smaller borehole was drilled through the sealed interval and the split-spoon sampling continued to the lower till (hard silt/clay zone) below the sand and gravel unit.¹

The sand and gravel piezometers (PS-1, PS-2, PS-3, and PS-4) were installed through the steel casing to a depth of approximately 2 feet above the bottom of the sand and gravel unit (top of the

¹ After extending the boring through the casing at two of the proposed sand and gravel piezometer locations, sand and gravel was not encountered. The soil information for these locations is shown on boring logs PS-2-O (original location) and PS-3-O (original location). New locations were chosen for PS-2 and PS-3 as shown on Figure 1.

The sand and gravel piezometers (PS-1, PS-2, PS-3, and PS-4) were installed through the steel casing to a depth of approximately 2 feet above the bottom of the sand and gravel unit (top of the lower till silt/clay zone). Two-inch diameter PVC well screen (0.10-inch slot) was installed from the base of piezometer to within 5 feet of the top of the sand and gravel unit, then threaded with solid PVC riser pipe extending to the ground surface.

Annular materials included filter sand from the base of the boring to approximately two feet above the top of the screen. A bentonite pellet seal was installed from the top of the filter sand. The bentonite seal is approximately three feet thick and located to extend above the till/sand interface, except at Piezometer PS-1 where the pellet bentonite seal was extended into the 10-inch casing. After the bentonite pellets were hydrated, the remaining annular space was filled with cement bentonite grout. Each sand and gravel piezometer was completed at the ground surface with a flush well protector collar and cover anchored by a surrounding concrete pad.

Till Unit Piezometer Installation

The till unit piezometers were drilled using the hollow-stem auger method. A 4.25-inch hollow-stem auger was advanced to approximately 3 feet above the top of the sandy soils or the sand and gravel zone as determined by borings PS-1 through PS-4. No soil sampling was conducted at the till piezometer locations. Well logs are included in Attachment 1.

PVC well screen (2-inch diameter) was installed within the till unit, with screen lengths ranging from 2 feet to 8 feet. PVC riser pipe was threaded onto the PVC screen and extended to the ground surface. Annular materials include filter sand from the base of the boring to 2 feet above the top of the screen. The remaining annulus was backfilled with bentonite chips as the augers were extracted. Each till piezometer was completed at the ground surface with a flush well protector collar and cover, anchored by a surrounding concrete pad.

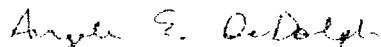
Piezometer Development

The piezometers were developed on June 22 and 23, 2006. The till piezometers were bailed dry at least twice. The sand and gravel piezometers were developed by pumping using a whaler pump. Over 10 well volumes of ground water were removed from each of the sand and gravel piezometers.

Please do not hesitate to call us if you have any questions or require additional information concerning the completion of the installation of the TBCW piezometers.

Sincerely,

ENVIRON International Corporation

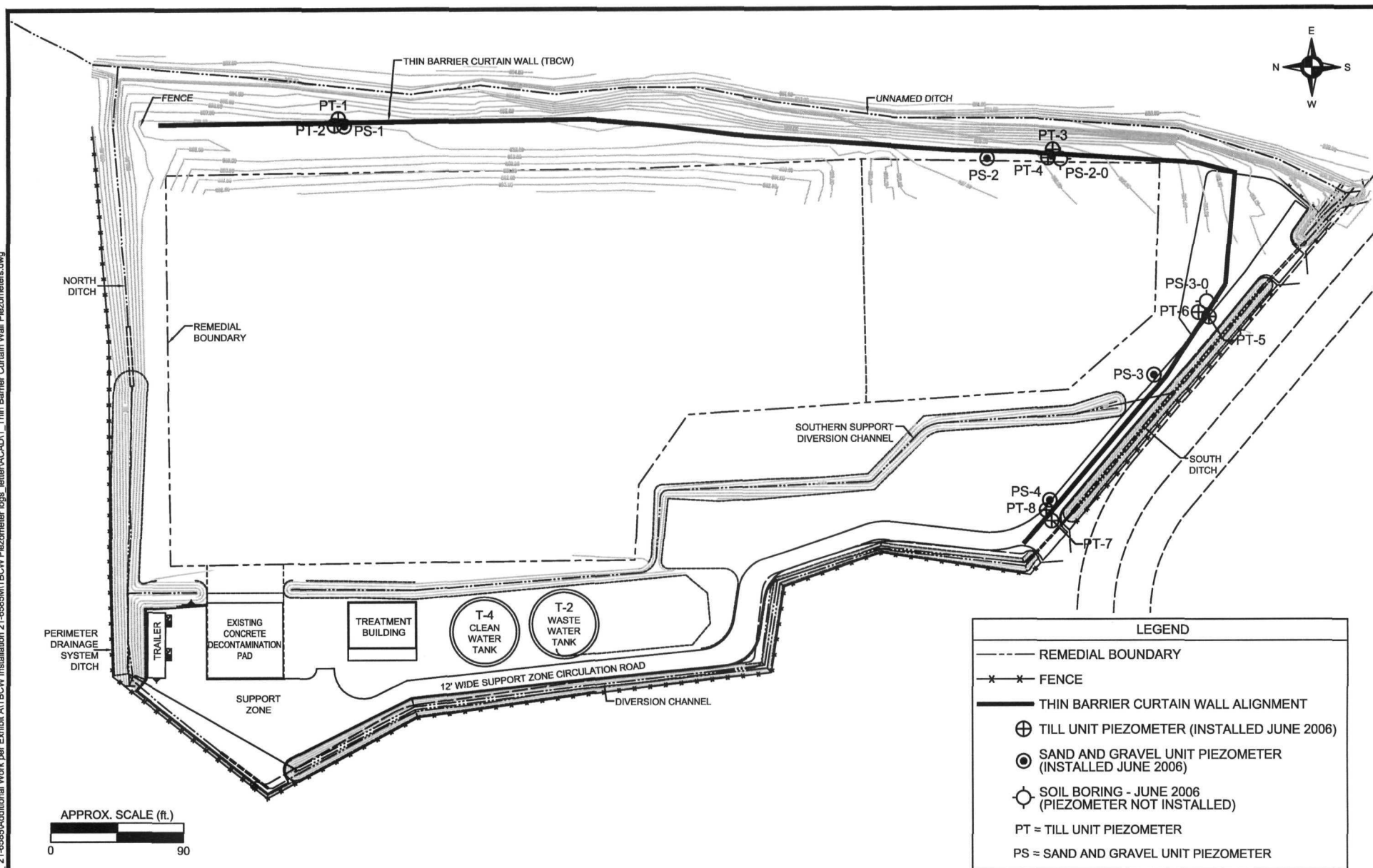


Angela E. DeDolph
Manager

cc: Thomas Krueger, Esq. – USEPA
Mr. Bruce Hamilton – IDEM
Mr. Timothy Harrison – CH2M HILL
Mr. Philip Smith – CH2M HILL
Ms. Catherine Schripsema – CH2M HILL
Mr. Norman Bernstein – Trustee
Mr. John Imse – ENVIRON International Corporation

FIGURE

R:\Client Project Files\IECC- 21-6585\Additional Work per Exhibit A\TBCW Installation 21-6585\MTBCW Piezometer logs_letter\ACAD\1 Thin Barrier Curtain Wall Piezometers.dwg



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THIN BARRIER CURTAIN WALL PIEZOMETERS
 ENVIRO-CHEM SITE
 ZIONSVILLE, INDIANA

Figure
1

Drafter: APR

Date: 10/19/06

Contract Number: 21-6585M

Approved:










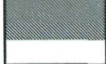


Revised:

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Boring and Piezometer Construction Logs

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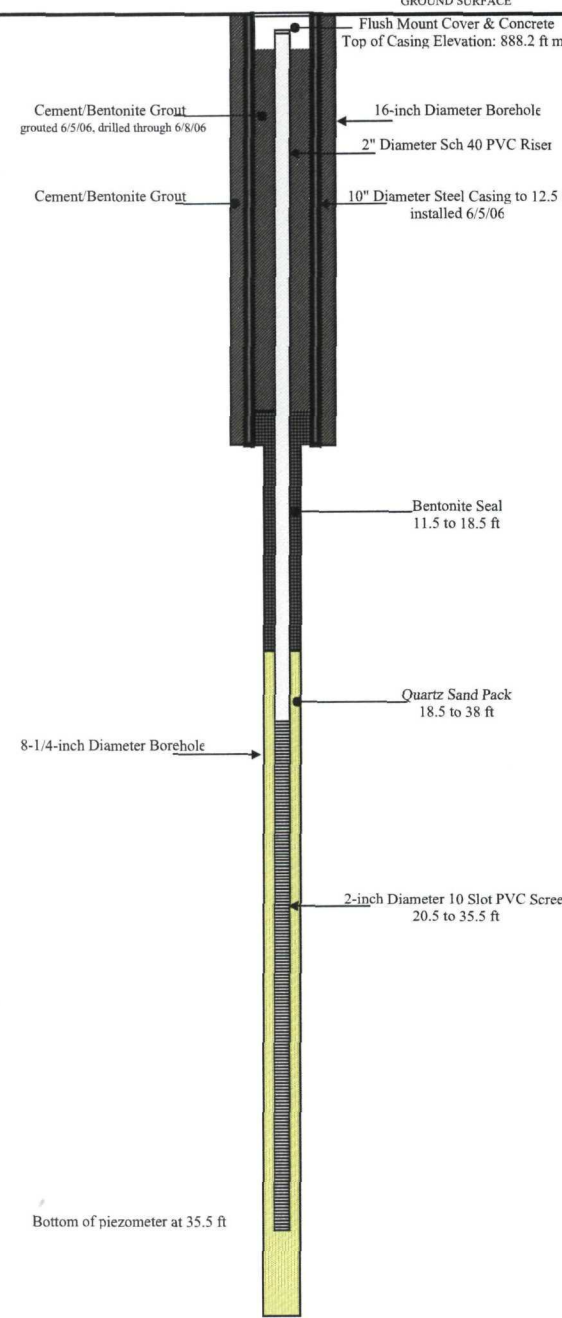
SOIL BORING LOG KEY

	TOPSOIL
	GRAVEL
	SANDY GRAVEL
	GRAVELLY SAND
	SAND
	SILTY SAND
	SANDY SILT
	SILT
	CLAYEY SILT
	SILTY CLAY
	CLAY
	CLAYEY SAND
	SANDY CLAY

WELL CONSTRUCTION LOG KEY

	RISER
	SCREEN
	BENTONITE
	SAND PACK
	GROUT

WELL LOG

PROJECT NAME:				WELL NUMBER:			
ECC TBCW Piezometers				PS-1			
PROJECT NUMBER:				DRILLING DATE:			
21-6585M				6/5/06 and 6/8/06			
PROJECT LOCATION:				FIELD PERSON:			
Enviro-Chem Site, Zionsville, IN				Doug Burge, P.G.			
DRILLING CONTRACTOR:				TOTAL WELL DEPTH:			
Earth Exploration, Inc				35.5 feet			
RIG TYPE:				WELL DIAMETER / MATERIAL:			
D-120 ATV				2-inch diameter Schedule 40 PVC			
LITHOLOGY DESCRIPTION	DESCRIPTION INTERVAL (ft)	PTD (ppm)	Blow Counts (per 6")	Recovery GRAPHIC LITHOLOGY	DEPTH (ft bgs)	WELL CONSTRUCTION DETAIL	
Gravel fill	0-4.5				1--	 <p>GROUND SURFACE</p> <p>Flush Mount Cover & Concrete Top of Casing Elevation: 888.2 ft msl</p> <p>Cement/Bentonite Grout grouted 6/5/06, drilled through 6/8/06</p> <p>16-inch Diameter Borehole</p> <p>2" Diameter Sch 40 PVC Riser</p> <p>Cement/Bentonite Grout</p> <p>10" Diameter Steel Casing to 12.5 ft installed 6/5/06</p>	
		0	6/9/9/9	0	2--		
					3--		
					4--		
Clayey silt, brownish gray, trace root hairs, stiff, slightly cohesive, moist.	4.5-6	0	6/6/6/9	0.8	5--	<p>Bentonite Seal 11.5 to 18.5 ft</p>	
					6--		
Silty clay, brownish gray, trace fine sand, cohesive, plastic, stiff, moist.	6-10.5	0	9/7/5/5	1.7	7--	<p>Quartz Sand Pack 18.5 to 38 ft</p>	
					8--		
		0	1/2/7/10	0	9--		
					10--		
Silty clay till, olive gray to medium dark gray (N4), some small to medium pebbles, little fine sand, very stiff, moist.	10.5-18.4	0	3/7/9/10	2	11--	<p>8-1/4-inch Diameter Borehole</p>	
					12--		
		0	5/4/4/7	1.6	13--		
					14--		
Sand and gravel and very coarse to coarse sand, little medium sand to fine sand, subrounded poorly sorted, medium dark gray, wet.	18.4-37.5	0	3/3/3/4	0	15--	<p>Bottom of piezometer at 35.5 ft</p>	
					16--		
		0	47/19/14/14	1.5	17--		
					18--		
		0	3/11/17/19	1.7	19--		
					20--		
		0	3/99/21/29	0.8	21--		
					22--		
		0	17/19/20/21	2	23--		
					24--		
		0	25/14/12/10	2	25--		
					26--		
Silt, olive gray to medium gray, noncohesive to very slightly cohesive, nonplastic, stiff, wet.	37.5-40	0	22/21/9/6	1.3	27--	<p>2-inch Diameter 10 Slot PVC Screen 20.5 to 35.5 ft</p>	
					28--		
		0	21/15/11/7	1.5	29--		
					30--		
		0	22/22/12/10	1.7	31--		
					32--		
		0	33/15/10/11	1.7	33--		
					34--		
		0	6/9/6/6	1.4	35--		
					36--		
		0	31/18/13/14	2	37--		
					38--		
		0	12/8/7/21	2	39--		
					40--		

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WELL LOG

PROJECT NAME:		ECC TBCW Piezometers		WELL NUMBER:		PS-2	
PROJECT NUMBER:		21-6585M		DRILLING DATE:		6/14/06, 6/15/06 and 6/19/06	
PROJECT LOCATION:		Enviro-Chem Site, Zionsville, IN		FIELD PERSON:		Doug Burge, P.G.	
DRILLING CONTRACTOR:		Earth Exploration, Inc		TOTAL WELL DEPTH:		20 feet	
RIG TYPE:		D-120 ATV		WELL DIAMETER / MATERIAL:		2-inch diameter Schedule 40 PVC	
LITHOLOGY DESCRIPTION	DESCRIPTION INTERVAL (ft)	PID (ppm)	Blow Counts (per 6")	Recovery	GRAPHIC LITHOLOGY	DEPTH (ft bgs)	WELL CONSTRUCTION DETAIL
Gravel fill at surface	0-4					1--	<p>GROUND SURFACE</p> <p>Flush Mount Cover & Concrete Top of Casing Elevation: 886.15 ft</p> <p>16-inch Diameter Borehole</p> <p>2-inch Diameter Sch 40 PVC Riser</p> <p>10-inch Diameter Steel Casing to 10 ft installed 6/15/06</p> <p>Cement/Bentonite Grout grouted 6/15/06, drilled through 6/19/06</p> <p>Cement/Bentonite Grout to 12.5 ft</p> <p>Bentonite Seal 12.5 to 15 ft</p> <p>Quartz Sand Pack 15 to 22 ft</p> <p>2-inch Diameter 10 Slot PVC Screen 17 to 20 ft</p> <p>8-1/4-inch Diameter Borehole</p> <p>Bottom of piezometer at 20 ft</p>
Gravel and silty clay fill, yellowish brown		0	10/7/5/3	0.8		2--	
						3--	
Silty clay trace pebbles, roots, sand, plastic, very moist.	4-6.4	0	3/2/2/2	1.1		4--	
						5--	
Silty clay, little fine sand, pebbles, wood, olive gray to medium gray with mottling, moist.	6.4-8.9	0	2/3/3/4	1.7		6--	
						7--	
						8--	
Clayey silt, medium gray, stiff, moist.	8.9-10.3	0	3/3/3/3	2		9--	
						10--	
						11--	
Silty clay, medium dark gray, stiff, with seam of very coarse sand at 10.5 to 11 feet and seam of sandy clay at 13 feet.	10.3-14	0	0/0/2/6	1		12--	
						13--	
						14--	
Medium to coarse sand, trace fine sand, medium gray, wet.	14-17.1	0	6/9/14/12	0.8		15--	
						16--	
Small gravel with coarse sand, medium gray, changing to broken rock with sand; with seam of silty clay at 18.2 feet.	17.1-21.2	0	11/12/15/14	1.5		17--	
						18--	
						19--	
						20--	
						21--	
						22--	
Silty clay, sand and gravel, medium to olive gray, moist.	21.2-24	0	25/19/32/30	1.6		23--	
						24--	

Note: PS-2 piezometer installed approximately 40 feet north of PS-2-O (original location).

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BORING LOG

PROJECT NAME:		ECC TBCW Piezometers		BORING NUMBER:		PS-2-O (Original Boring Location)	
PROJECT NUMBER:		21-6585M		DRILLING DATE:		6/6/06, 6/12/06 and 6/13/06	
PROJECT LOCATION:		Enviro-Chem Site, Zionsville, IN		FIELD PERSON:		Doug Burge, P.G.	
DRILLING CONTRACTOR:		Earth Exploration, Inc		TOTAL BORING DEPTH:		30 feet	
RIG TYPE:		D-120 ATV		WELL DIAMETER / MATERIAL:		well not installed	
LITHOLOGY DESCRIPTION	DESCRIPTION INTERVAL (ft)	PID (ppm)	Blow Counts (per 6")	Recovery	GRAPHIC LITHOLOGY	DEPTH (ft bgs)	WELL CONSTRUCTION DETAIL (well not installed)
							GROUND SURFACE
Gravel fill.	0-2.3					1--	<p>16-inch Diameter Borehole</p> <p>10" Diameter Steel Casing to 7.5 ft installed 6/6/06</p> <p>Cement/Bentonite Grout grouted 6/6/06</p> <p>Cement/Bentonite Grout drilled through 6/12/06</p> <p>Cement/Bentonite Grout grouted 6/13/06</p> <p>8-1/4-inch Diameter Borehole</p>
						2--	
						3--	
Silty clay, little fine sand, dark yellowish brown, cohesive, plastic, very moist.	2.3-8	0	3/2/3/3	1		4--	
		0	2/2/3/4	1.4		5--	
		0	2/3/3/3	1.1		6--	
						7--	
Silty clay till, little fine sand, pebbles, medium gray, plastic, stiff, moist.	8-14.5	0	1/2/2/4	1.2		8--	
		0	3/3/3/3	1.3		9--	
		0	3/3/4/8	1.2		10--	
						11--	
						12--	
Sandy silty clay till, medium gray, slightly cohesive, with seam of fine sand at 17.5 feet, moist.	14.5-19.5	0	4/4/8/6	1.3		13--	
		0	7/11/12/11	1.8		14--	
		0	5/7/9/10	1.5		15--	
						16--	
						17--	
Silty clay till, little sand, pebbles, medium gray, stiff, moist with seam of medium-coarse sand at 23.5 feet.	19.5-30	0	5/10/10/15	1.8		18--	
		0	5/11/11/12	1.7		19--	
		0	7/19/29/32	0.2		20--	
		0	10/14/20/25	1.9		21--	
		0	9/13/33/53	1.3		22--	
						23--	
						24--	
						25--	
						26--	
						27--	
						28--	
						29--	
						30--	

Piezometer not installed; see PS-2

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WELL LOG

PROJECT NAME:		ECC TBCW Piezometers		WELL NUMBER:		PS-3	
PROJECT NUMBER:		21-6585M		DRILLING DATE:		6/15/06 and 6/20/06	
PROJECT LOCATION:		Enviro-Chem Site, Zionsville, IN		FIELD PERSON:		Doug Burge, P.G.	
DRILLING CONTRACTOR:		Earth Exploration, Inc		TOTAL WELL DEPTH:		32 feet	
RIG TYPE:		D-120 ATV		WELL DIAMETER / MATERIAL:		2-inch diameter Schedule 40 PVC	
LITHOLOGY DESCRIPTION	DESCRIPTION INTERVAL (ft)	FID (ppm)	Blow Counts (per 6")	Recovery	GRAPHIC LITHOLOGY	DEPTH (ft lbs)	WELL CONSTRUCTION DETAIL
Gravel fill						1--	GROUND SURFACE
						2--	Flush Mount Cover & Concrete Top of Casing Elevation: 882.67 ft
Silty clay, trace pebbles, roots, brownish gray to medium gray, stiff, moist; with sand seam at 7.8 feet.	2-8	0	5/3/5/5	0.6		3--	Cement/Bentonite Grout grouted 6/15/06, drilled through 6/20/06
		0	4/4/4/4	2		4--	16-inch Diameter Borehole
		0	4/3/3/4	2		5--	2" Diameter Sch 40 PVC Riser
						6--	Cement/Bentonite Grout
Silty clay, some fine sand, olive to med gray, soft.	8-10	0	2/2/2/2	1.8		7--	
						8--	10" Diameter Steel Casing to 15 ft installed 6/15/06
Silty clay till, trace to some sand, medium gray, cohesive, wet; with sand seams at 10.7- and 12.6-foot depths.	10-17	0	2/2/4/4	0.9		9--	
		0	9/7/9/5	1.4		10--	
		0	5/6/6/8	1.5		11--	
		0	2/2/3/2	1.3		12--	
Very coarse sand, with silty clay, medium gray, loose, wet.	17-19.5	0	2/2/3/4	1.8		13--	
						14--	
Medium to coarse sand and small gravel, medium gray, loose, wet. (Sand heave and thin seam of silty clay noted around 20 feet).	19.5-32.5	0	8/8/9/10	1.3		15--	
		0	10/12/15/16	1.8		16--	
		0	15/15/13/10	1.4		17--	Bentonite Seal 16 ft to 19.5 ft
		0	16/13/11/12	1.5		18--	
		0	9/9/8/10	1.3		19--	
		0	8/8/6/7	1.5		20--	
						21--	8-1/4-inch Diameter Borehole
						22--	Quartz Sand Pack 19.5 ft to 36 ft
						23--	
						24--	
Fine sand, medium gray, loose, wet.	32.5-35	0	22/12/13/20	1.5		25--	
		0	8/8/7/9	1.2		26--	2-inch Diameter 10 Slot PVC Screen 22 to 32 ft
Silt, little to some clay, trace pebbles, medium gray, plastic, wet.	35-38	0	5/6/7/9	1.4		27--	
						28--	
						29--	
						30--	
						31--	
						32--	Bottom of piezometer at 32 feet
						33--	
						34--	
						35--	
						36--	
						37--	
						38--	

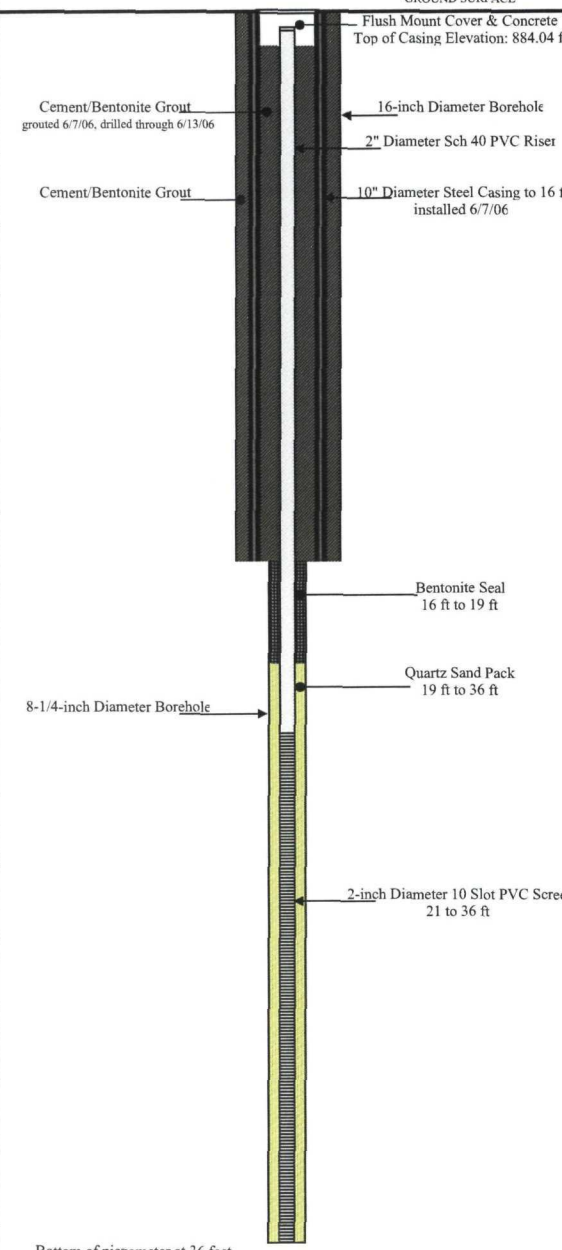
Note: PS-3 piezometer installed approximately 60 feet northwest of boring PS-3-O (original location).

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BORING LOG

BORING LOG						
PROJECT NAME:	ECC TBCW Piezometers		BORING NUMBER:		PS-3-O (Original Boring Location)	
PROJECT NUMBER:	21-6585M		DRILLING DATE:		6/6/06 and 6/12/06	
PROJECT LOCATION:	Enviro-Chem Site, Zionsville, IN		FIELD PERSON:		Doug Burge, P.G.	
DRILLING CONTRACTOR:	Earth Exploration, Inc		TOTAL BORING DEPTH:		40 feet	
RIG TYPE:	D-120 ATV		WELL DIAMETER / MATERIAL:		well not installed	
LITHOLOGY DESCRIPTION	DESCRIPTION INTERVAL (ft)	PID (ppm)	(per Blow Counts 6")	Recovery	GRAPHIC LITHOLOGY	DEPTH (ft bgs)
GROUND SURFACE						
Gravel fill	0-2.6					1--
						2--
Silty clay, little fine sand, trace roots, medium dark gray, stiff, moist.	2.6-6.8	0	11/3/4/4	0.8		3--
						4--
		0	3/3/3/3	0.6		5 --
						6--
Silty clay, trace sand, brownish gray, moist.	6.8-8.7	0	4/2/2/5	1.4		7--
						8--
Fine sand , some silty clay, trace pebbles, olive gray, wet.	8.7-10	0	2/1/1/2	1.1		9--
						10--
Silty clay, trace sand, brownish gray, with seam of sand at 10.7 feet.	10-12.4	0	2/2/4/4	1.4		11--
						12--
Silty clay till, little fine sand, pebbles, olive gray to medium dark gray, moist, stiff to very stiff, with seams with sand and gravel at 32.5 feet.	12.4-40	0	2/3/5/5	1.4		13--
						14--
		0	6/5/10/9	1		15--
						16--
		0	3/3/3/4	0.9		17--
						18--
		0	2/2/3/4	1.2		19--
						20--
		0	3/3/5/6	0.9		21--
						22--
		0	2/3/4/5	1.4		23--
						24--
		0	3/3/6/9	1.1		25--
						26--
		0	3/5/6/9	1.3		27--
						28--
		0	2/2/4/8	1.3		29--
						30--
		0	2/4/8/10	1.4		31--
						32--
				33--		
				34--		
				35--		
				36--		
				37--		
				38--		
				39--		
				40--		
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WELL LOG

PROJECT NAME:		ECC TBCW Piezometers		WELL NUMBER:		PS-4	
PROJECT NUMBER:		21-6585M		DRILLING DATE:		6/7/06 and 6/13/06	
PROJECT LOCATION:		Enviro-Chem Site, Zionsville, IN		FIELD PERSON:		Doug Burge, P.G.	
DRILLING CONTRACTOR:		Earth Exploration, Inc		TOTAL WELL DEPTH:		36 feet	
RIG TYPE:		D-120 ATV		WELL DIAMETER / MATERIAL:		2-inch diameter Schedule 40 PVC	
LITHOLOGY DESCRIPTION	DESCRIPTION INTERVAL (ft)	PID (ppm)	Blow Counts (per 6")	Recovery GRAPHIC LITHOLOGY	DEPTH (ft bgs)	WELL CONSTRUCTION DETAIL	
Gravel fill changing to gravel and silty clay fill, loose.	0-3.5				1--	 <p>GROUND SURFACE</p> <p>Flush Mount Cover & Concrete Top of Casing Elevation: 884.04 ft</p> <p>Cement/Bentonite Grout grouted 6/7/06, drilled through 6/13/06</p> <p>16-inch Diameter Borehole</p> <p>2" Diameter Sch 40 PVC Riser</p> <p>Cement/Bentonite Grout</p> <p>10" Diameter Steel Casing to 16 ft installed 6/7/06</p>	
		0	12/26/18/18	1.7	2--		
Silty clay, trace fine sand, wood, roots, medium dark gray to brownish gray, cohesive, stiff, moist.	3.5-6				3--		
		0	4/3/3/4	1.3	4--		
Fine to medium sand with silty clay, trace coarse sand, brownish gray to yellowish brown, loose, wet.	6-9.1				5--		
		0	5/4/4/4	0	6--		
Silty clay till, some to little fine sand, yellowish brown to brownish gray, stiff, moist, with seam of sand at 10.7 feet.	9.1-13				7--		
		0	2/3/6/7	1.6	8--		
					9--		
		0	2/3/6/7	1.5	10--		
					11--		
		0	3/6/5/8	1.4	12--		
Silty clay till, little fine sand, medium to medium dark gray, very stiff, plastic, moist; with sand seam at 14.8 feet.	13-18				13--		
		0	2/5/6/0	1.5	14--		
					15--		
		0	<1/3/4/5	1.4	16--		
					17--		
		0	2/4/8/10	2	18--		
Silty clay till, some sand and small gravel, medium gray to olive gray, very plastic, moist.	18-21				19--		
		0	5/52/44/35	1.3	20--		
Sand and gravel, with layer of coarse sand.	21-22.7				21--		
		0	7/29/19/20	1.5	22--		
Silty clay till with coarse sand and small gravel, med gray, plastic, wet.	22.7-24				23--		
		0	7/19/17/17	1.8	24--		
Fine to medium sand with layers of very coarse sand and gravel, loose, wet.	24-28				25--		
		0	14/17/17/18	1.6	26--		
					27--		
		0	17/13/16/26	1.7	28--		
Silty clay with coarse sand, plastic.	28-30.2				29--		
		0	16/16/19/21	1.8	30--		
Fine-medium sand to Fine sand, medium gray, loose, wet.	30.2-37.2				31--		
		0	15/16/19/21	1.4	32--		
					33--		
		0	9/16/23/25	1.4	34--		
					35--		
		0	13/11/10/16	1.6	36--		
Clayey silt, medium gray, plastic, wet.	37.2-40				37--		
		0	8/8/12/16	1.8	38--		
					39--		
					40--		

WELL LOG

PROJECT NAME:		ECC TBCW Piezometers		WELL NUMBER:		PT-1	
PROJECT NUMBER:		21-6585M		DRILLING DATE:		6/9/06	
PROJECT LOCATION:		Enviro-Chem Site, Zionsville, IN		FIELD PERSON:		Doug Burge, P.G.	
DRILLING CONTRACTOR:		Earth Exploration, Inc.		TOTAL DEPTH:		16 feet	
RIG TYPE:		D-120 ATV		WELL DIAMETER / MATERIAL:		2-inch diameter Schedule 40 PVC	
LITHOLOGY DESCRIPTION		DESCRIPTION INTERVAL (ft)	PID (ppm)	Blow Counts (per 6")	GRAPHIC LITHOLOGY	DEPTH (ft bgs)	WELL CONSTRUCTION DETAIL
PT-1 drilled without sampling. Soil descriptions from adjacent boring PS-1 included.							GROUND SURFACE
Gravel fill.		0-4.5	0	See PS-1 log		0.5 1--- 1.5 2--- 2.5 3--- 3.5 4--- 4.5	Flush Mount Cover & Concrete Apron Top of Casing Elevation: 887.93 ft amsl
Clayey silt, brownish gray, trace root hairs, stiff, slightly cohesive, moist.		4.5-6	0			5--- 5.5 6--- 6.5	2" SCH 40 PVC RISER TO 11 FT
Silty clay, brownish gray, trace fine sand, cohesive, plastic, stiff, moist.		6-10.5	0			7--- 7.5 8--- 8.5 9--- 9.5 10--- 10.5	BENTONITE SEAL (HYDRATED CHIPS) TO 9 FT
Silty clay till, olive gray to medium dark gray (N4), some small to medium pebbles, little fine sand, very stiff, moist.		10.5-16	0			11--- 11.5 12--- 12.5 13--- 13.5 14--- 14.5 15--- 15.5 16---	#5 FILTER PACK SAND 9 TO 16 FT
							2-IN DIA 10 SLOT WELL SCREEN 11 TO 16 FT
							8.25 DIAMETER BOREHOLE (4.25 ID AUGERS)
							Bottom of piezometer at 16 feet

WELL LOG

PROJECT NAME:		ECC TBCW Piezometers		WELL NUMBER:		PT-2	
PROJECT NUMBER:		21-6585M		DRILLING DATE:		6/9/06	
PROJECT LOCATION:		Enviro-Chem Site, Zionsville, IN		FIELD PERSON:		Doug Burge, P.G.	
DRILLING CONTRACTOR:		Earth Exploration, Inc.		TOTAL DEPTH:		16 feet	
RIG TYPE:		D-120 ATV		WELL DIAMETER / MATERIAL:		2-inch diameter Schedule 40 PVC	
LITHOLOGY DESCRIPTION		DESCRIPTION INTERVAL (ft)	PID (ppm)	Blow Counts (per 6")	GRAPHIC LITHOLOGY	DEPTH (ft bgs)	WELL CONSTRUCTION DETAIL
PT-2 drilled without sampling. Soil descriptions from adjacent boring PS-1 included. <i>Gravel fill.</i>		0-4.5	0	See PS-1 log		0.5 1--- 1.5 2--- 2.5 3--- 3.5 4--- 4.5	<div>GROUND SURFACE</div> <div>Flush Mount Cover & Concrete Apron Top of Casing Elevation: 888.16 ft amsl</div> <div>2" SCH 40 PVC RISER TO 11 FT</div>
<i>Clayey silt, brownish gray, trace root hairs, stiff, slightly cohesive, moist.</i>		4.5-6	0			5--- 5.5 6---	
<i>Silty clay, brownish gray, trace fine sand, cohesive, plastic, stiff, moist.</i>		6-10.5	0			6.5 7--- 7.5 8--- 8.5 9--- 9.5 10--- 10.5	<div>BENTONITE SEAL (HYDRATED CHIPS) TO 9 FT</div> <div>#5 FILTER PACK SAND 9 TO 16 FT</div>
<i>Silty clay till, olive gray to medium dark gray (N4), some small to medium pebbles, little fine sand, very stiff, moist.</i>		10.5-16	0			11--- 11.5 12--- 12.5 13--- 13.5 14--- 14.5 15--- 15.5 16---	<div>2-IN DIA 10 SLOT WELL SCREEN 11 TO 16 FT</div> <div>8.25 DIAMETER BOREHOLE (4.25 ID AUGERS)</div> <div>Bottom of piezometer at 16 feet</div>

ENVIRON

WELL LOG

PROJECT NAME:	ECC TBCW Piezometers	WELL NUMBER:	PT-3
PROJECT NUMBER:	21-6585M	DRILLING DATE:	6/20/06
PROJECT LOCATION:	Enviro-Chem Site, Zionsville, IN	FIELD PERSON:	Doug Burge, P.G.
DRILLING CONTRACTOR:	Earth Exploration, Inc.	TOTAL DEPTH:	14 feet
RIG TYPE:	CME75	WELL DIAMETER / MATERIAL:	2-inch diameter Schedule 40 PVC

LITHOLOGY DESCRIPTION	DESCRIPTION INTERVAL (ft)	PID (ppm)	Blow Counts (per 6")	GRAPHIC LITHOLOGY	DEPTH (ft bgs)	WELL CONSTRUCTION DETAIL
GROUND SURFACE						
PT-3 drilled without sampling. Soil descriptions from adjacent boring PS-2-O provided below.					0.5	Flush Mount Cover & Concrete Apron Top of Casing Elevation: 885.42 ft amsl
<i>Gravel fill.</i>	0-2.3		See PS-2-O log		1-- 1.5 2--	
<i>Silty clay, little fine sand, dark yellowish brown, cohesive, plastic, very moist.</i>	2.3-8	0			2.5 3-- 3.5 4-- 4.5 5-- 5.5 6-- 6.5 7-- 7.5 8--	2" SCH 40 PVC RISER TO 12 FT
<i>Silty clay till, little fine sand, pebbles, medium gray, plastic, stiff, moist.</i>	8-14	0			8.5 9-- 9.5 10-- 10.5 11-- 11.5 12-- 12.5 13-- 13.5 14--	BENTONITE SEAL (HYDRATED CHIPS) TO 10 FT
						#5 FILTER PACK SAND 10 TO 14 FT
						2-IN DIA. 10 SLOT WELL SCREEN 12 TO 14 FT
						8.25 DIAMETER BOREHOLE (4.25 ID AUGERS)
						Bottom of piezometer at 14 feet

ENVIRON

WELL LOG

PROJECT NAME:	ECC TBCW Piezometers	WELL NUMBER:	PT-4
PROJECT NUMBER:	21-6585M	DRILLING DATE:	6/21/06
PROJECT LOCATION:	Enviro-Chem Site, Zionsville, IN	FIELD PERSON:	Doug Burge, P.G.
DRILLING CONTRACTOR:	Earth Exploration, Inc.	TOTAL DEPTH:	14 feet
RIG TYPE:	CME75	WELL DIAMETER / MATERIAL:	2-inch diameter Schedule 40 PVC

LITHOLOGY DESCRIPTION	DESCRIPTION INTERVAL (ft)	PID (ppm)	Blow Counts (per 6")	GRAPHIC LITHOLOGY	DEPTH (ft bgs)	WELL CONSTRUCTION DETAIL
GROUND SURFACE						
PT-4 drilled without sampling. Soil descriptions from adjacent boring PS-2-O provided below. <i>Gravel fill.</i>	0-2.3		See PS-2-O log		0.5 1— 1.5 2—	Flush Mount Cover & Concrete Apron Top of Casing Elevation: 885.40 ft amsl 2" SCH 40 PVC RISER TO 12 FT
<i>Silty clay, little fine sand, dark yellowish brown, cohesive, plastic, very moist.</i>	2.3-8	0			2.5 3— 3.5 4— 4.5 5— 5.5 6— 6.5 7— 7.5 8—	BENTONITE SEAL (HYDRATED CHIPS) TO 10 FT
<i>Silty clay till, little fine sand, pebbles, medium gray, plastic, stiff, moist.</i>	8-14	0			8.5 9— 9.5 10— 10.5 11— 11.5 12— 12.5 13— 13.5 14—	#5 FILTER PACK SAND 10 TO 14 FT 2-IN DIA. 10 SLOT WELL SCREEN 12 TO 14 FT 8.25 DIAMETER BOREHOLE (4.25 ID AUGERS) Bottom of piezometer at 14 feet

ENVIRON

WELL LOG

WELL LOG					
PROJECT NAME:	ECC TBCW Piezometers		WELL NUMBER:	PT-5	
PROJECT NUMBER:	21-6585M		DRILLING DATE:	6/21/06	
PROJECT LOCATION:	Enviro-Chem Site, Zionsville, IN		FIELD PERSON:	Doug Burge, P.G.	
DRILLING CONTRACTOR:	Earth Exploration, Inc.		TOTAL DEPTH:	23 feet	
RIG TYPE:	CME75		WELL DIAMETER / MATERIAL:	2-inch diameter Schedule 40 PVC	
LITHOLOGY DESCRIPTION	DESCRIPTION INTERVAL (ft)	PID (ppm)	Blow Counts (per 6")	GRAPHIC LITHOLOGY	DEPTH (ft log)
GROUND SURFACE					
PT-5 drilled without sampling. Soil description from adjacent boring PS-3-O provided below.			See PS-3-O log		0.5
Gravel fill.	0-2.6	0			1— 1.5 2—
Silty clay, little fine sand, trace roots, medium dark gray, stiff, moist.	2.6-6.8	0			2.5 3— 3.5 4— 4.5 5— 5.5 6— 6.5
Silty clay, trace sand, brownish gray, moist.	6.8-8.7	0			7— 7.5 8—
Fine sand, some silty clay, trace pebbles, olive gray, wet.	8.7-10	0			8.5 9— 9.5
Silty clay, trace sand, brownish gray, with seam of sand at 10.7 feet.	10-12.4	0			10— 10.5 11— 11.5 12— 12.5
Silty clay till, little fine sand, pebbles, olive gray to medium dark gray, stiff to very stiff, moist.	12.4-23	0			13— 13.5 14— 14.5 15— 15.5 16— 16.5 17— 17.5 18— 18.5 19— 19.5 20— 20.5 21— 21.5 22— 22.5 23—
<p>Flush Mount Cover & Concrete Apron Top of Casing Elevation: 882.14 ft amsl</p> <p>2" SCH 40 PVC RISER TO 15 FT</p> <p>BENTONITE SEAL (HYDRATED CHIPS) TO 13 FT</p> <p>#5 FILTER PACK SAND 13 TO 23 FT</p> <p>2-IN DIA. 10 SLOT WELL SCREEN 15 TO 23 FT</p> <p>8.25 DIAMETER BOREHOLE (4.25 ID AUGERS)</p> <p>Bottom of piezometer at 23 feet</p>					

WELL LOG

WELL LOG					
PROJECT NAME:	ECC TBCW Piezometers			WELL NUMBER:	PT-6
PROJECT NUMBER:	21-6585M			DRILLING DATE:	6/21/06
PROJECT LOCATION:	Enviro-Chem Site, Zionsville, IN			FIELD PERSON:	Doug Burge, P.G.
DRILLING CONTRACTOR:	Earth Exploration, Inc.			TOTAL DEPTH:	23 feet
RIG TYPE:	CME75			WELL DIAMETER / MATERIAL:	2-inch diameter Schedule 40 PVC
LITHOLOGY DESCRIPTION	DESCRIPTION INTERVAL (ft)	PID (ppm)	(per Blow Counts 6")	GRAPHIC LITHOLOGY	DEPTH (ft bgs)
WELL CONSTRUCTION DETAIL					
GROUND SURFACE					
PT-6 drilled without sampling. Soil description from adjacent boring PS-3-O provided below.			See PS-3-O log		0.5
Gravel fill.	0-2.6	0			1--
					1.5
					2--
					2.5
Silty clay, little fine sand, trace roots, medium dark gray, stiff, moist.	2.6-6.8	0			3--
					3.5
					4--
					4.5
					5--
					5.5
					6--
					6.5
					7--
Silty clay, trace sand, brownish gray, moist.	6.8-8.7	0			7.5
					8--
					8.5
Fine sand, some silty clay, trace pebbles, olive gray, wet.	8.7-10	0			9--
					9.5
					10--
Silty clay, trace sand, brownish gray with seam of sand at 10.7 feet.	10-12.4	0			10.5
					11--
					11.5
					12--
					12.5
Silty clay till, little fine sand, pebbles, olive gray to medium dark gray, stiff to very stiff, moist.	12.4-23	0			13--
					13.5
					14--
					14.5
					15--
					15.5
					16--
					16.5
					17--
					17.5
					18--
					18.5
					19--
					19.5
					20--
					20.5
					21--
					21.5
					22--
					22.5
					23--
					23--

Flush Mount Cover & Concrete Apron
Top of Casing Elevation: 882.58 ft amsl

2" SCH 40 PVC RISER
TO 15 FT

BENTONITE SEAL (HYDRATED
CHIPS) TO 13 FT

#5 FILTER PACK SAND
13 TO 23 FT

2-IN DIA. 10 SLOT WELL SCREEN
15 TO 23 FT

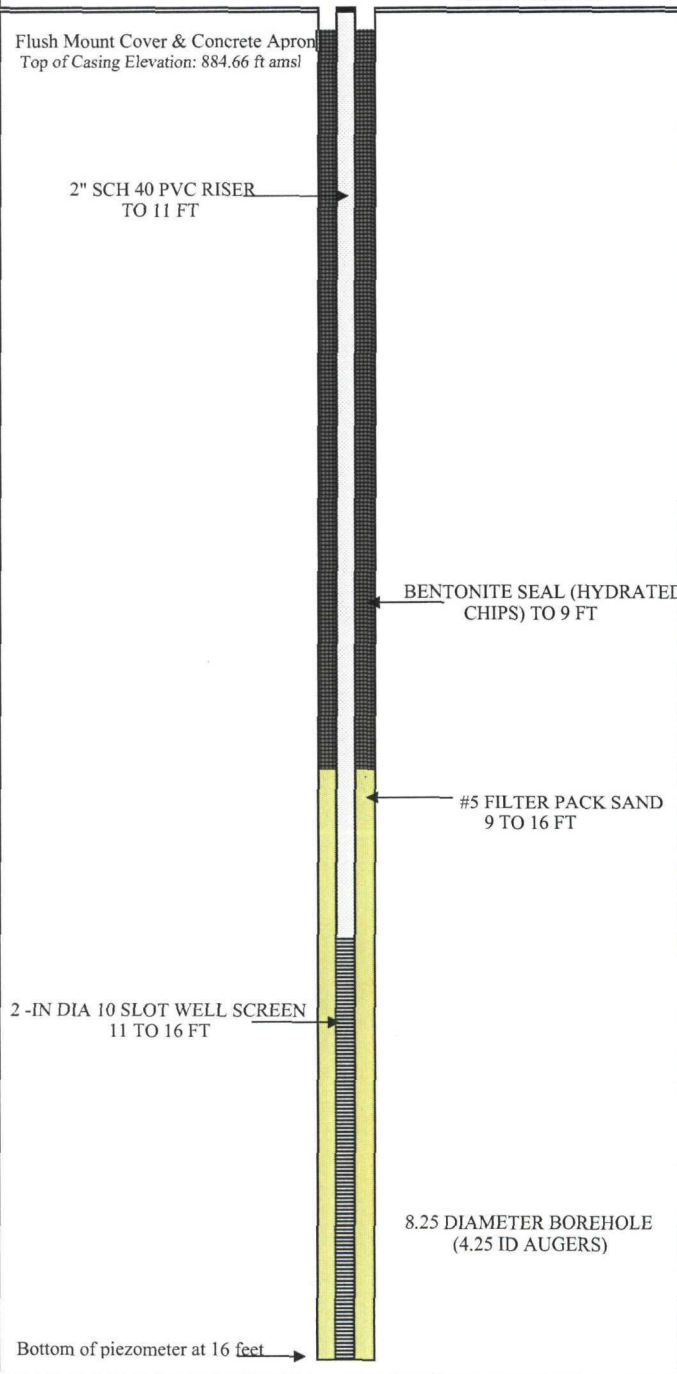
8.25 DIAMETER BOREHOLE
(4.25 ID AUGERS)

Bottom of piezometer at 23 feet

WELL LOG

PROJECT NAME:	ECC TBCW Piezometers	WELL NUMBER:	PT-7
PROJECT NUMBER:	21-6585M	DRILLING DATE:	6/14/06
PROJECT LOCATION:	Enviro-Chem Site, Zionsville, IN	FIELD PERSON:	Doug Burge, P.G.
DRILLING CONTRACTOR:	Earth Exploration, Inc.	TOTAL DEPTH:	16 feet
RIG TYPE:	D-120 ATV	WELL DIAMETER / MATERIAL:	2-inch diameter Schedule 40 PVC

LITHOLOGY DESCRIPTION	DESCRIPTION INTERVAL (ft)	PID (ppm)	Blow Counts (per 6")	GRAPHIC LITHOLOGY	DEPTH (ft bgs)	WELL CONSTRUCTION DETAIL
						GROUND SURFACE
PT-7 drilled without sampling. Soil description from adjacent boring PS-4 provided below..					0.5	Flush Mount Cover & Concrete Apron Top of Casing Elevation: 884.66 ft amsl
Gravel fill changing to gravel and silty clay fill, loose.	0-3.5	0	See PS-4 log		1--	2" SCH 40 PVC RISER TO 11 FT
					1.5	
					2--	
					2.5	
					3--	
Silty clay, trace fine sand, wood, roots, medium dark gray to brownish gray, cohesive, stiff, moist.	3.5-6	0			3.5	
					4--	
					4.5	
					5--	
					5.5	
Fine to medium sand with silty clay, trace coarse sand, brownish gray to yellowish brown, loose, wet.	6-9.1	0			6--	
					6.5	
					7--	
					7.5	
					8--	
Silty clay till, some to little fine sand, yellowish brown to brownish gray, stiff, moist, with seam of sand at 10.7 feet.	9.1-13	0			8.5	
					9--	
					9.5	
					10--	
					10.5	
Silty clay till, little fine sand, medium to medium dark gray, very stiff, plastic, moist; with sand seam at 14.8 feet.	13-16	0			11--	
					11.5	
					12--	
					12.5	
					13--	
					13.5	
					14--	
					14.5	
					15--	
					15.5	
					16--	Bottom of piezometer at 16 feet



WELL LOG

PROJECT NAME:	ECC TBCW Piezometers	WELL NUMBER:	PT-8
PROJECT NUMBER:	21-6585M	DRILLING DATE:	6/14/06
PROJECT LOCATION:	Enviro-Chem Site, Zionsville, IN	FIELD PERSON:	Doug Burge, P.G.
DRILLING CONTRACTOR:	Earth Exploration, Inc.	TOTAL DEPTH:	16 feet
RIG TYPE:	D-120 ATV	WELL DIAMETER / MATERIAL:	2-inch diameter Schedule 40 PVC

LITHOLOGY DESCRIPTION	DESCRIPTION INTERVAL (ft)	PID (ppm)	Blow Counts (per 6")	GRAPHIC LITHOLOGY	DEPTH (ft bgs)	WELL CONSTRUCTION DETAIL	
						GROUND SURFACE	
PT-8 drilled without sampling. Soil description from adjacent boring PS-4 provided below.	0-3.5	0	See PS-4 log		0.5	Flush Mount Cover & Concrete Apron Top of Casing Elevation: 884.73 ft amsl	
Gravel fill changing to gravel and silty clay fill, loose.					1---		
					1.5		
					2---		
					2.5		
Silty clay, trace fine sand, wood, roots, medium dark gray to brownish gray, cohesive, stiff, moist.	3.5-6	0			3---	2" SCH 40 PVC RISER TO 11 FT	
					3.5		
					4---		
					4.5		
					5---		
Fine to medium sand with silty clay, trace coarse sand, brownish gray to yellowish brown, loose, wet.	6-9.1	0			6---	BENTONITE SEAL (HYDRATED CHIPS) TO 9 FT	
					6.5		
					7---		
					7.5		
					8---		
Silty clay till, some to little fine sand, yellowish brown to brownish gray, stiff, moist, with seam of sand at 10.7 feet.	9.1-13	0			8.5	#5 FILTER PACK SAND 9 TO 16 FT	
					9---		
					9.5		
					10---		
					10.5		
Silty clay till, little fine sand, medium to medium dark gray, very stiff, plastic, moist; with sand seam at 14.8 feet.	13-16	0			11---	2 -IN DIA 10 SLOT WELL SCREEN 11 TO 16 FT	
					11.5		
					12---		
					12.5		
					13---		
					13.5	8.25 DIAMETER BOREHOLE (4.25 ID AUGERS)	
					14---		
					14.5		
					15---		
					15.5		
					16---	Bottom of piezometer at 16 ft bgs	